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Comparison of Environmental Health Indices of Private Clinics in Chramahal and Bakhtiari Province, Iran

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ABSTRACT

A clinic is a site in which patients have high potential risks. Therefore, inspecting the environmental health conditions of clinics is very important for community health and preventing infection. This research was carried to investigate the environmental indices of clinics in Chramahal and Bakhtiari province. A cross sectional study was done in 2013 in 342 clinics using a checklist comprising the following items: Ventilation , heating and light, solid waste management, disinfection equipment, physical space, welfare facilities, environmental sanitation, water and wastewater management, and safety and protection. The checklist consisted of 42 items. Data were analyzed using SPSS software version 13. The results showed that the highest mean (0.97±0.86) was observed for physical space and the least mean (0.45±0.12) was observed for disinfection equipment. Results also indicated that that 96.5% of the clinics had ventilation, heating and light, 29.2% had solid waste management, 33.6% had disinfection equipment, 91.2% had physical space, 86.3% had welfare facilities, 26.3% had environmental sanitation, 50.3% had water and wastewater management, and 31.9% had safety and protection schemes. It can be concluded from the results of the present study that the best small province regarding the environmental health criteria in clinics was Boroujen and the worst was Cohrang. The findings could serve as a reference for the design and management of privacy clinic.

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INTRODUCTION

A doctor's office is place where patients with health conditions go for treatment, which is provided by specialists and other care professionals. The health-care environment contains a diverse population of microorganisms, but only a few are significant susceptible pathogens [1]. Basic environmental health criteria include ventilation and heating. Ventilation and air conditioning systems in health-care facilities are designed to maintain the indoor air temperature and humidity at comfortable levels for staff, patients, and visitors; control odours, remove contaminated air, facilitate air-handling requirements to protect susceptible staff and patients from airborne health-care–associated pathogens, and minimize the risk for transmission of airborne pathogens from infected patients [2,3]. In susceptible hosts, a variety of airborne infections can result from exposures to clinically significant microorganisms released into the air when environmental reservoirs (i.e., soil, water, dust, and decomposing organic matter) are disturbed [4]. Once these materials are brought indoors into a health-care facility by any of of the common vehicles (e.g., people, air currents, water, construction materials, and equipment), the attendant microorganisms can increase in several indoor ecological niches and, if subsequently disbursed into the air, serve as a source for airborne health-care–associated infections. The key to controlling the spread of these diseases is suitable ventilation [5]. Physical space: Waiting rooms and reception areas offer the opportunity for patient-to-patient transmission of infectious agents. One solution is to avoid crowding and to shorten waiting times as much as possible [6]. Disinfection equipment: All equipment should be cleaned regularly and stored where it will not be contaminated. Equipment that will contact only intact skin requires cleaning and low level disinfection. Equipment having contact with mucous membranes requires cleaning and high level disinfection, whereas instruments that penetrate into the skin or mucosal membranes must be cleaned and then sterilized [7]. Solid waste management: Waste from any health care facility is divided into two categories: hazardous and general. Legislation dictates that hazardous waste be handled and disposed of in a manner that prevents transmission of potential infections. It is essential to understand the differences between

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these types of waste so that clinics and private offices can separate the waste and make arrangements for appropriate disposal of biomedical waste. It is necessary that this waste be transported to an approved facility for treatment by incineration, autoclaving, and chemical or other means and be disposed of as approved by local regulations [8]. Water and wastewater management: Treated municipal water enters a doctor's office by way of the water mains and is distributed throughout the building(s) by a network of pipes constructed of galvanized iron, copper, and polyvinylchloride [8]. Overall, reduction of disease and anxiety has been accomplished largely by shifting the environment. Clinics' environmental health contains a wide range of routine activities, including cleaning the general environment of the clinic; cleaning items of shared equipment; and education of workers.

Most previous studies have shown that the physical status of building users can be affected by various indoor environmental parameters, such as temperature, humidity, ventilation, natural lighting or illumination, and noise [9,10,11,12]. We did not find in the literature any previous research concerning comparison of environmental health indices of private clinics. Thus, the aim of this study was to compare the environmental health indices of private clinics in Chramahal and Bakhtiari province, Iran.

MATERIALS AND METHODS

Charharmahal and Bakhtiari is a small province in southeast of Iran, with a population of 857,910 (2011) and an area of 16,403 km^2. The province is mainly active in the agriculture sector. The industrial sector is mainly clustered around the center of the province. The province has the potential to become a vibrant tourist attraction because of its natural resources. The province of Charharmahal and Bakhtiari has 6 cities: Shahre-kord, Borujen, Farsan, Lordegan, Ardel, and Kohrang. A cross sectional study was done in 2013 in the 6 cities of the province in 342 clinics using a checklist comprising the following items: Ventilation , heating ,and light(6 items), solid waste management(1item), equipment of disinfection(2 items), physical space(5 items),welfare facilities(5 items), environment sanitation(11 items), water and wastewater(8 items), safety and protection(4 items).

The checklist consisted of 42 items overall. This checklist was developed according to the regulations the Iranian Ministry of Health and Medical education [13]. Data were analyzed using SPSS software version 13.

Results:

In this study, checklists were completed in 342 clinics. The results showed that the highest mean (0.97±0.86) was observed for physical space and the least mean (0.45±0.12) was observed for disinfection equipment (Table1). The results also showed that the major problem was environmental sanitation (73.7% , 252 cases). Results also indicated that that 96.5% of the clinics had ventilation, heating and light, 29.2% had solid waste management, 33.6% had disinfection equipment, 91.2% had physical space, 86.3% had welfare facilities, 26.3% had environmental sanitation, 50.3% had water and wastewater management, and 31.9% had safety and protection schemes (Table2). In the cities, the best ventilation , heating, and light index were observed for Kohrang (100%), Farsan (100%), Shahre-kord (99.5%), Borujen (86.8%), and Ardel (62.5%) (Table 3).

Table 1: Mean of indicators environmental health at clinic in Chramahal and Bakhtiari province.

Indicator	Mean±SD
Ventilation , heating,and light	0.93±0.12
solid waste management	0.63±0.24
equipment of disinfection	0.45±0.12
physical space	0.97±0.08
welfare facilities	0.84±0.14
environment sanitation	0.59±0.3
water and wastewater	0.7±0.27
safety and protection	0.66±0.16

Table 2: Status of indicators environmental health at clinic in Chramahal and Bakhtiari province.

Indicator	Suitable*		Unsuitable**	
	n	%	n	%
Ventilation , heating and Light	330	96.5	12	3.5
Solid waste management	200	29.2	242	70.8
Equipment of disinfection	115	33.6	227	66.4
Physical space	312	91.2	30	8.8
Welfare facilities	295	86.3	47	13.7
Environment sanitation	90	26.3	252	73.7
Water and wastewater	172	50.3	170	49.7
Safety and protection	109	31.9	233	68.1

*More than 80% agreement,**less than 80% agreement

Discussion:

The results show that the best indicator of environmental health in this study was ventilation , heating and light. Ventilation in healthcare facilities is extremely important for both patients and workers as it provides thermal comfort and prevents harmful emissions of airborne pathogenic materials. Ventilation requirements depend also on geographical location, as well as economic background [14]. It can be concluded from the results of the present study that the best small province regarding the environmental health criteria in clinics was Boroujen and the worst was Cohrang.

A clinic hosts three different categories of people: medical workers, patients, and visitors. For this reason, the clinic's environment must be visibly clean; free from non-essential items and equipment, dust and dirt; and acceptable to patients, visitors and workers [15]. Patients have a short clinic stay and are probably more interested in their health than in indoor conditions, while workers work there permanently, therefore environmental conditions inside the building can influence their work and health. The results reported here indicate that faults in safety and protection, equipment of disinfection, environment sanitation, and solid waste management in privacy clinics are common and widespread. Recommendations for solving the problems include:

Improving the standards of environmental health management in private clinics.

Environmental law requires clear and robust procedures to ensure correct administration.

Enhancing the collaboration with the supervision team such as assistance treatment, assistance health ,and medical order organization.

Enhancing the supervision of solid medical waste. Collection, separation, transportation, and disposal are usually unsatisfactory and do not meet the standards recommended by national and international regulatory bodies. Therefore, considerable improvement of working conditions, facilities, and legislation is necessary.

There is an urgent need for further studies to be conducted on other aspects of private clinics which are not covered by this study.

Table 3: Percentage of indicators environmental health are suitable at clinic in Chramahal and Bakhtiari province.

Indicator	Borujen		Shahre-kord		Farsan		Ardel		Lordegan		Kohrang	
	n	%	n	%	n	%	n	%	n	%	n	%
Ventilation , heating and Light	46	86.8	220	99.5	24	100	5	62.5	30	96.8	5	100
Solid waste management	33	62.3	45	20.4	9	37.5	2	25	11	35.5	0	0
Equipment of disinfection	43	81.1	59	26.7	8	33.3	2	25	3	9.7	0	0
Physical space	45	84.9	218	98.6	14	58.4	3	37.5	28	90.3	0	0
Welfare facilities	40	75.5	199	90	21	87.5	1	12.5	31	100	3	60
Environment sanitation	13	24.5	52	23.5	11	45.8	2	25	10	32.3	40	2
Safety and protection	16	30.2	73	33	5	20.8	1	12.5	14	45.2	0	0
Water and wastewater	25	47.2	123	55.7	12	50	0	0	12	38.7	0	0

Conclusion:

Based on the results from the present work, some environmental indexes were found to be unsuitable in the inspected clinics, including safety and protection, disinfection equipment, environmental sanitation, and solid waste management. Therefore, it is necessary to develop supervision and monitoring throughout the year with collaboration of the Ministry of Health and Medical Education to ensure that private clinics can provide a safe environment for patients as well as the clinical staff.

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